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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,959	12/02/2003	Mathews J. Thundyil	5741	2834
44341	7590	02/23/2007		
JACOBSON & JOHNSON ONE WEST WATER STREET, SUITE 285 ST. PAUL, MN 55107			EXAMINER DRODGE, JOSEPH W	
			ART UNIT	PAPER NUMBER
			1723	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		02/23/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/725,959	Applicant(s) THUNDYIL ET AL.	
	Examiner Joseph W. Drodge	Art Unit 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-17,19,20,22-30 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 28,29,33 and 34 is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,8-14,16,17,19,20,22-27,30 and 32 is/are rejected.
- 7) ☒ Claim(s) 3,6 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1723

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,2,4,5,13,14,19,20,22,23, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by newly cited Lizama et al patent 5,458,752. For independent claims 1,13, and 30, Lizama et al introduces an aqueous, polar, extraction liquid into a fluid (organic liquid) having an unwanted liquid constituent therein so as to form a physical emulsion comprising droplets under 10 microns in diameter that are dispersed or suspended in the fluid (column 5, lines 42-62); allows the droplets to interact by polar forces (the extraction liquid is water which is polar and immiscible with the organic liquid) to form microdroplets in a second process step/subjected to 2nd transient high-intensity electric field (column 5, lines 62-66), and capture/separate the microdroplets (by actions of biocatalysts, adsorption and desorption processes at fluid interfaces and by removal of phases from different outlets of the reaction chamber (column 4, lines 63-67, column 5, lines 18-21 and column 6, lines 32-43) and coalesce the microdispersed into larger droplets (column 5, line 66). The amounts/volumes of both introduced extraction liquid and organic liquid are controlled by computer (column 6, lines 46-49). For independent claim 30, the larger coalesced droplets may also be captured and thus separated (column 6, lines 32-43).

For recitations in dependent claims not covered in the preceding paragraph, Lizama also discloses removal and recovery of liquid, and liquid, acidic species (column

Art Unit: 1723

9, especially Table 2), introduction of liquids of varied types into plural inlets of the reaction and contact chamber (column 4, lines 10-41, column 5, lines 17-40 and column 6, lines 46-48), downstream separators (figure 5 and corresponding text), co-current or counter-current flow (column 5, lines 5-12), outlets may be oriented vertically (figure 1) and/or horizontally (figure 4).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

Art Unit: 1723

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8-12,16,17,24-26 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lizama et al patent 5,458,752 (newly cited) in view of Bayley et al British Patent 1,443,704 of record.

These claims all differ in requiring the steps of capturing and coalescing of microdroplets to include capturing with a porous medium, which may constitute a liquid/liquid separation device. However, Bayley teaches to capture, separate and coalesce droplets of a dispersed emulsion using such liquid/liquid, porous medium, comprising separation device (see especially page 1, lines 30-93 etc.). It would have been obvious to one of ordinary skill in the art to have modified the Lizama process by utilizing the porous liquid/liquid separation device of Bayley in the process, so as to increase the capacity of the separator, increase the separation rate of the dispersion and increase the inventory of mixtures that can be processed while minimizing the required size of the processing system. Bayley is pertinent to separation processes involving dispersed phases containing small droplets (page 5, lines 84-105).

For dependent claims rejected over the combination of Lizama and Bayley, Bayley teaches the coalescing and separation medium being of varied orientations and labyrinth formations and configurations (page 3, lines 23-28 and lines 79-104, page 4, lines 70-83). The medium may be oriented vertically (figure 2) or horizontally when applied in a series of stages (page 5, lines 27-61).

ALLOWABLE SUBJECT MATTER

Claims 3,6,15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. These claims are all now distinguished in view of recitation of the liquid or fluid being processed comprising silicone fluid.

Lizama et al and related Scott et al patent 5,358,614 are specific to processes concerning treating petroleum products with biocatalysts or removal of constituents from bulk organic liquids using biocatalysts, specifically. Hence, neither Lizama or Scott et al processes are amenable to treatment of silicone-containing fluid streams.

The formerly applied teaching references pertaining to treatment of silicone streams do not suggest processes utilizing biocatalysts. The independent claims as now amended also all distinguish over Bayley et al in view of respective recitations of forming a plurality of extraction liquid droplets, already of the recited small size of being under 10 micron diameters, followed by forming of a plurality of microdroplets, before coalescing to form larger droplets.

Claims 28-30,33 and 34 are now all distinguished over the prior art. . These claims are all now distinguished in view of recitation of the liquid or fluid being processed comprising silicone fluid.

Lizama et al and related Scott et al patent 5,358,614 are specific to processes concerning treating petroleum products with biocatalysts or removal of constituents from bulk organic liquids using biocatalysts, specifically. Hence, neither Lizama or Scott et al processes are amenable to treatment of silicone-containing fluid streams.

The formerly applied teaching references pertaining to treatment of silicone streams do not suggest processes utilizing biocatalysts. The independent claims as now amended also all distinguish over Bayley et al in view of respective recitations of forming a plurality of extraction liquid droplets, already of the recited small size of being under 10 micron diameters, followed by forming of a plurality of microdroplets, before coalescing to form larger droplets.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Scott et al patent 5,358,614 is of record is similar in scope to Lizama et al pertaining to separating liquid phases by processes utilizing formation of microdroplets followed by coalescing, however more directly pertaining to bioconversion of constituents from bulk organic liquids.

Applicant's arguments with respect to claims 1,2,4,5,8-14,16,17,19,20,22-27,30 and 32 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit: 1723

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steve Griffin, can be reached at 571-272-1189. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

February 19, 2007

Joseph Drodge
Primary Patent Examiner